What is claimed is:

1. A phased array antenna comprising:

a plurality of radiating elements;

a feed line assembly;

a ground plane positioned between the plurality of radiating elements and the feed line assembly;

a phase shifter coupled to the feed line assembly;

the ground plane having a plurality of pairs of orthogonal openings, each pair of orthogonal openings positioned adjacent to one of the radiating elements; and

the feed line assembly including a plurality of microstrip lines, each of the microstrip lines including a first portion positioned adjacent to one of the pairs of orthogonal openings.

2. A phased array antenna as recited in claim 1, wherein:

the openings are elongated.

3. A phased array antenna as recited in claim 1, further comprising:

a linear microstrip line connected to the plurality of microstrip lines, wherein each of the plurality of microstrip lines extends perpendicularly from the linear microstrip line.

4. A phased array antenna as recited in claim 3, wherein the plurality of radiating elements are arranged in a plurality of rows and columns, and wherein the feed line assembly further comprises:

additional linear microstrip lines and additional pluralities of microstrip lines extending perpendicularly from the additional linear microstrip lines.

5. A phased array antenna as recited in claim 1, wherein:

the first portion of each of the plurality of microstrip lines includes a 90° bend, and the bend is positioned between sections of the first portion that are positioned adjacent to the orthogonal openings in one of the pairs of orthogonal openings.

6. A phased array antenna as recited in claim 1, wherein:

the first portion of each of the plurality of microstrip lines has a predetermined length for providing a 90° phase shift between the openings of an adjacent one of the pairs of orthogonal openings.

7. A phased array antenna as recited in claim 1, wherein the phase shifter comprises:

a first substrate;

a tunable dielectric film positioned on a surface of the first substrate;

a coplanar waveguide positioned on a surface of the tunable dielectric film opposite the substrate;

an input for coupling a radio frequency signal to the coplanar waveguide;

an output for receiving the radio frequency signal from the coplanar waveguide; and

a connection for applying a control voltage to the tunable dielectric film.

8. A phased array antenna as recited in claim 7, further comprising:

a first impedance matching section of the coplanar waveguide coupled to the input; and

a second impedance matching section of the coplanar waveguide coupled to the output.

9. A phased array antenna as recited in claim 8, further wherein the first impedance matching section comprises a first tapered coplanar waveguide section; and

wherein the second impedance matching section comprises a second tapered coplanar waveguide section.

10. A phased array antenna as recited in claim 7, wherein the connection for applying a control voltage to the tunable dielectric film comprises:

a first electrode position adjacent a first side of a conductive strip of the coplanar waveguide to form a first gap between the first electrode and the conductive strip; and

a second electrode position adjacent a second side of the conductive strip to form a second gap between the second electrode and the conductive strip.

11. A phased array antenna as recited in claim 10, further comprising:

a third electrode position adjacent a first side of the first electrode opposite the conductive strip to form a third gap between the first electrode and the third electrode; and

a fourth electrode position adjacent a first side of the second electrode opposite the conductive strip to form a fourth gap between the second electrode and the fourth electrode.

12. A phased array antenna as recited in claim 10, further comprising:

a conductive dome electrically connected between the first and second electrodes.

13. A phased array antenna as recited in claim 7, wherein the substrate comprises one of:

MgO, $LaAlO_3$, sapphire, $A1_20_3$, and a ceramic.

14. A phased array antenna as recited in claim 7, wherein the substrate has a dielectric constant of less than 25.

15. A phased array antenna as recited in claim 7, wherein the tunable dielectric film has a dielectric constant of greater than 300.

16. A phased array antenna as recited in claim 7, wherein the phase shifter further comprises:

a second substrate positioned adjacent to an end of the first substrate;

a microstrip line positioned on a surface of the second substrate; and

a connection between the microstrip line and a conductive strip of the coplanar waveguide.

17. A phased array antenna as recited in claim 7, wherein the tunable dielectric film comprises one of the group of:

barium strontium titanate ($Ba_xSr_{1-x}TiO_3$, BSTO, where x is less than 1), BSTO-MgO, BSTO-$MgAl_2O_4$, BSTO-$CaTiO_3$, BSTO-$MgTiO_3$, BSTO-$MgSrZrTiO_6$, and combinations thereof.

18. A phased array antenna as recited in claim 7, wherein the tunable dielectric film comprises a barium strontium titanate composite.

19. A phased array antenna as recited in claim 7, wherein the tunable dielectric film has a dielectric constant between 70 and 600, a tuning range of 20 to 60 %, and a loss tangent between 0.008 and 0.03 at K and Ka bands.

20. A phased array antenna as recited in claim 1, further comprising:

a conductive housing enclosing the phase shifter.